



## Subject card

Subject name and code	Mathematical methods of physics and technics II, PG_00037303						
Field of study	Technical Physics						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2022/2023		
Education level	first-cycle studies	Subject group			Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Atomic, Molecular and Optical Physics -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Radosław Szmytkowski				
	Teachers		prof. dr hab. Radosław Szmytkowski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	60		5.0		35.0	100
Subject objectives	To acquaint students with selected mathematical methods of physics and technology and with their applications.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_U02		Students know how to apply selected mathematical methods in description of physical processes.		[SU4] Assessment of ability to use methods and tools		
	K6_W03		Students are familiar with selected mathematical methods used in physics and technology.		[SW1] Assessment of factual knowledge		
Subject contents	1. Fundamentals of variational calculus.  2. Elements of Lagrangian mechanics.  3. Elements of Hamiltonian mechanics.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Grade of exercises		37.5%		100.0%		
Recommended reading	Basic literature		1. G. B. Arfken, H. J. Weber, Mathematical methods for physicists, 5th ed., Academic, San Diego, 2001  2. D. ter Haar, Elements of Hamiltonian mechanics, 2nd ed., Pergamon, Oxford, 1964				
	Supplementary literature		None.				

	eResources addresses	<p>Podstawowe</p> <p><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30232">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30232</a> - Course page on the eNauczanie platform.</p> <p>Adresy na platformie eNauczanie:</p> <p>Metody matematyczne fizyki i techniki II - Moodle ID: 30232</p> <p><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30232">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30232</a></p>
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. The Euler-Lagrange equations.</li> <li>2. The variational principle of Hamilton.</li> <li>3. The Hamilton equations.</li> <li>4. The Hamilton-Jacobi equation.</li> </ol>	
Work placement	Not applicable	